II. REMARKS

1. Claims 1, 2, 6-20, 24-29, 31-35, 37-43, and 54-68 remain in the application. Claims 3-5, 21-23, 30, 36, and 44-53 have been canceled without prejudice.

2. Applicants appreciate the indication that claims 12 and 31 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. However, Applicants believe that these claims are patentable as they stand for the reasons stated below.

3. Applicants respectfully submit that claims 1, 2, 6-11, 13-20, 24-29, 32-35, 37-43, and 54-68 are not anticipated by Kalevo et al. (WO 98/41025, "Kalevo") under 35 USC 102(b).

3.1 Kalevo fails to disclose or suggest determining a value of at least one parameter of the adaptive block boundary filtering operation performed on the block boundary, where the determination is made by examination of the types of the first and second encoding methods, as recited by independent claims 1, 19, 37-43, 54-57, and 68.

Applicants acknowledge that the Examiner correctly states that the filtering operation in Kalevo depends on various parameters including the size of the quantization step in the coding process. The examiner, however, then argues that a large difference value or significantly different quantization parameters between two blocks across the boundary indicates that the blocks are of different types. Applicants respectfully submit that this is clearly not the case.

Kalevo presents a method for removing blocking artifacts from a frame of a video sequence. According to Kalevo's method, a certain number of pixels (n) are selected for examination from both sides of a block boundary, the number of pixels selected depending on the image content of the frame in the environment of the block boundary (see abstract). More specifically, according to Kalevo, the number of pixels to be corrected, the characteristic features of the filter being used and the

size of the filtering window depend upon the following factors (see page 4, lines 8 to 20 of WO 98/41025):

a) the difference between pixel values across a block boundary to be filtered;

b) the size of the quantization step of the transformation coefficients used in transformation coding of the image blocks; and

c) differences in values between pixels on the first side of the block boundary and corresponding differences between pixels on the second side of the block boundary.

Thus, Applicants agree with the examiner that the filtering operation applied in Kalevo involves the size of quantization step used in the coding process (36 or 42), i.e., a parameter of the encoding method applied to an image block whose boundary is being filtered. However, in Kalevo the encoding methods used to encode image blocks on either side of the block boundary are not examined and therefore cannot play a role in the determination of parameter values used in filtering.

A large difference value or significantly different quantization parameters does not indicate that different encoding methods have been used on both sides of the block boundary. Applicants respectfully submit that this is conclusion is not taught by Kalevo.

As mentioned above, Kalevo clearly disclose that selection is based on the image content of the frame in the environment of the block boundary, particularly on the difference of the pixel values across the block boundary and the size of the quantization step of the transformation coefficients used in the transformation coding of the blocks. Hence, Kalevo clearly implies that the image content can affect to the difference of the pixel values across the block boundary and the size of the quantization step. However, image contents and encoding method are not the same thing. For example, in practice, the following situations could exist:

a) one situation in which a large difference value exists across a block boundary although the encoding methods across block boundaries were the same, and

b) another situation in which a small difference value exists across a block boundary although the encoding methods across block boundaries were not the same.

It should be appreciated that there is, in general, no fixed relationship between the level of pixel value differences within/between adjacent blocks and the encoding methods chosen to encode the image blocks. It should also be appreciated that there is, in general, no fixed relationship between the size of the quantization step size and the encoding methods chosen to encode the image blocks.

Therefore, to re-iterate, the block boundary filtering method presented in Kalevo does not involve examination of a first encoding method that was used to encode a decoded image block on a first side of the block boundary and examination of a second encoding method that was used to encode a second decoded image block on a second side of the block boundary in order to determine a value of at least one parameter of the adaptive boundary filtering operation performed on the block boundary, as recited in the present independent claims.

Kalevo neither discloses nor provides any suggestion that an encoding method used to encode an image block can be taken into account when performing filtering operations intended to reduce blocking artifacts. In the present claims it is the encoding methods used to encode image blocks on a first and a second side of the block boundary that determine how the filtering is performed. It should be appreciated that there is, in general, no fixed relationship between the size of the quantization parameter and the encoding methods chosen to encode the image blocks.

An explanation of the encoding methods (also referred to as block types) used in a typical video encoder is provided on page 2, between lines 21 and 38 of the

present application as filed. In the cited passage, four encoding methods/block types are described (INTRA, COPY, CODED and NOT-CODED). Details of how the filtering operations performed on a boundary between image blocks are modified according to the block types, that is, encoding methods, of the blocks on either side of the boundary are provided, for example, on page 7, lines 18 to 38 and page 10, line 13 to page 11, line 13 (see especially Table 1 on page 11).

At least for these reasons, Applicants submit that Kalevo does not anticipate independent claims 1, 19, 37-43, 54-57, and 68, and dependent claims 2, 6-18, 20, 24-35, and 58-67.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

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Respectfully submitted,

6 November 2006
Joseph V. Gamberdell, Jr. Date
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